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Mr. Chairman and Members of the Committee, thank you for inviting the University of South Alabama to join the discussion of current conditions in rural healthcare in America, and to share our ideas and experiences in telemedicine for improving healthcare for rural Americans. We are proud of our initial efforts in this vital, lifesaving arena of medicine.

This Committee knows firsthand the medical challenges facing rural Americans. You especially realize that medical problems facing our urban medical centers grow exponentially in rural settings. Barriers of travel, economics, resources, and opportunities separate those in rural communities who need medical care from those who are able to provide it. In Alabama, our rural health care infrastructure has become increasingly fragile and stands now at a crisis point. Numerous factors affect the continuing viability of many rural hospitals to keep their doors open: a shortage of specialty care physicians; loss of already scarce nursing staff to urban hospitals; a large percentage of unfunded patients; and a reliance on payment systems that may not cover the costs of care. These often prevent rural residents from receiving sufficient access to health care.

A recent study commissioned by the Alabama State Hospital Association reported that fourteen mostly rural hospitals in Alabama are operating on negative margins and face the very real threat of closure. Alabama's rural physicians suffer from the same challenges: an adverse patient/payer mix; peer isolation; lack of suitable call coverage; and difficulties in recruiting staff. Against this backdrop rises the specter of a deadly storm of epidemics: obesity, diabetes, hypertension, heart disease, asthma, and cancer. CDC data continue to point to an at risk population, especially in the rural Southeast. Our area experiences significantly increased levels of cancer; 1 in 3 minority rural children run the risk of developing diabetes; and the African-American and Hispanic populations in rural Alabama are growing rapidly.

The Historic Role of Telemedicine

Since the late 1960's, telemedicine primarily has involved the use of video conferencing equipment connecting two sites – a basic hub and spoke model of care. The principal is to connect patients in rural hospitals with specialty physicians in urban hospitals or academic teaching centers. Most studies have indicated high patient satisfaction, thus, the hub and spoke system continues to dominate the telemedicine industry today.

USA's Telemedicine Experience

The University of South Alabama School of Medicine has achieved successes following its entry into rural telemedicine. We provided "big box" conference equipment, linking rural hospitals with our teaching medical center. However, sufficient transmission capability to enable this equipment to work does not always exist in some rural areas. Of course, we've established continuing medical education for rural hospitals, presenting our grand rounds for two-way discussions with rural doctors; and we have a patient education program. We've had great success with our rural neonatology consultation and treatment program, providing instant expertise to rural hospitals when low birth weight babies are born there and prior to our advanced neonatal teams arriving to transport the infants to our Women's and Children's Hospital. Two of our uses of telemedicine, however, deserve special recognition. We've created a "community of care ecosystem" for chronically ill patients with multiple disorders in several of our rural areas. Also, our tele-trauma consulting, transportation and treatment program is one of only four or five of its kind in the nation. These programs, especially, indicate the level of sophistication we already have achieved.

Community of Care Ecosystem:

USA equipped several hundred homes of chronically ill patients suffering multiple illnesses with $200 units that transmit vital medical conditions via these patients' telephones to USA's Medical Center where they are monitored. Readings outside normal parameters draw immediate calls or visits from healthcare providers. We have a great story about this success. Almost two years ago I visited the Grace Bussey Clinic in Pine Apple, Alabama. The healthcare system in Pine Apple is embodied in Dr. Rose Anne Cook. She is what I think we wish doctors everywhere were. Dr. Cook runs the clinic and to give you an idea of her dedication, let me share a story. On December 17th of last year she stopped to help some men whose car appeared to be broken down by the roadside. They beat her, robbed her, put her in the trunk of her car and fired four bullets into the trunk. Miraculously she was only grazed. In spite of her frightening event, Dr. Cook was seeing patients on December 18th in her clinic. When I first met Dr. Cook, she pointed out that, blocking her pharmacy, was a large video conferencing box left there but never installed because no local carrier would run a T1 line. Dr. Cook explained it wouldn't matter anyway. She felt clinically more comfortable with patients going to see a specialist where tests she couldn't provide could be run. I asked if there was anything I could do to help. She answered in a millisecond – "Yes, you can help me with my chronic patients." For the past 15 months we have done just that.

We recognized that healthcare delivery for chronic patients needed to be reinvented. Hospitals and specialists do quite well with episodic care – the nature of their business and training. Disease state management companies often do well with one condition, congestive heart failure most notably. But for the rural patient, managing one episode or one condition simply continues "frequent flyer travel" to the emergency room, leaving little true health improvement. Instead, what is needed is life state management – a recognition that many chronic patients in rural America suffer from a number of co-morbidities. Our rural hypertensive patients often are obese and diabetic, with breathing problems. They don't see a primary physician and they don't have a health maintenance

routine. Instead, they experience acute problems, go to their rural hospital emergency room, are "patched up" and sent on their way. ER's are not set up to provide the care they need. And the costs are astronomical. Further, most of these chronic patients are uninsured and unable to pay. This system presents "physically" life-threatening problems for the patients and "financially" life-threatening problems for the rural hospitals. That makes for bad medicine, bad care, and bad business.

In Pine Apple, AL, we took a core group of 50 people with multiple serious illnesses who, on average, used ER's at least 4 times per year. We equipped their homes with a small piece of high tech gear, monitored their conditions, called them when they needed blood pressure or sugar level consultations, sent community nurses when their conditions warranted, directed them to obtain immediate care when required, and served as their medical advisor and friend. A startling result occurred. In 15 months, there was only one ER visit among these 50 people. That meant 199 nonessential ER visits were eliminated, not only saving money to financially strapped rural hospitals, but more importantly, improving the quality of life for these 50 patients and their families. Our patients over the past 15 months have avoided hospitalizations, lost weight, dropped their blood pressure, begun to believe in their physicians' advice and, perhaps as important for us, become ambassadors to other patients to tell their stories.

We saw the need to manage the chronic rural patients' disorders to bring them back to a more normal health state. To do this takes a community of care – an "ecosystem" that enables life to thrive. Healthcare is too often practiced in silos with little information or data sharing among providers, payers, or hospitals. A community of care is a place where common important data about the patient resides. It becomes their record and our management tool. Telemedicine is an excellent, economical, and user-friendly way of accomplishing this vital medical service. This particular high-tech equipment is simple to use. Many of these patients read at the third grade level so it was a good match.

Tele-trauma:

Trauma treatment must be available, sophisticated, and immediate. The "golden hour" after a traumatic injury often makes the difference between life and death. We recognized that trauma treatment is more difficult in rural areas and, as a pilot program, established a link between the Monroe County Hospital and USA's trauma center. USA trauma surgeons provide coaching, care and evaluation of patients to rural doctors before USA's "SouthFlight" emergency helicopter arrives to transport the patient. We maximize patient treatment from the start through telemedicine. Also, our hospital trauma center is then better able to treat the patient when they arrive. Going one step further, we have "wired" the homes of our trauma physicians to make them available to rural doctors 24/7.

Challenges Facing Rural Medicine

The challenges we and other rural medical providers face, however, need to be recognized and addressed. First, the cost of equipping a site is not immodest. Second, "big box" telemedicine eats up significant bandwidth, consequently making T1 lines the connectivity of choice, but not always available in rural areas. Data transmission costs,

even with Universal Services contributions, can challenge rural hospital budgets. Also, consultations produce little revenue for rural hospitals. They would much prefer having the specialist physically present and doing billable procedures. Also, for the consulting physician, the process is not as time effective as the traditional office visit. The hub and spoke system often follows transmission lines rather than traditional referral patterns. The fact is that doctors do not refer their patients to "technology", instead, they refer them to peers. It leaves little doubt that one root cause of underperforming telemedicine systems can be found in human barriers more so than technical ones. Perhaps even more compelling is the fact that telemedicine, if inexpertly used, can also be guilty of episodic care to chronic problems.

Think Out of the Box in Telemedicine

Chronic multiple disease rates in rural America are daunting and compelling. The explosive growth of diabetes, hypertension, obesity and other conditions paint a picture of a population in need of a rational, economical, and 21st Century system of healthcare.

What USA Medical School has built is the beginning infrastructure for a new way of treating a patient – a patient with certain conditions that may be defined as chronic and long standing, but for whom compliance and management with drug, diet and exercise regimens will lead to a longer, healthier life. And in the future hopefully far more time under the identity of a person than a patient.

What does it take to build this community? Healthcare only works if all partners are equals at the table. Our community is a combination of high tech and high touch. First, let's discuss the technology. Common off the shelf technology whose data capture is transmitted to a data base across telephone lines is a far more sustainable technology deployment than large bandwidth hogs. If there is one transmission certainty in rural areas it is that you will generally find a telephone line. To meet Dr. Cook's needs of being able to better manage her chronic patients, we deployed small dual tone frequency modulators connected to the patients' standard telephone line with inexpensive peripherals for scales, glucose, blood pressure and others. Peripherals connect to the small box, about the size of a deck of cards, and transmit with the push of one button. The data is then stored in a database reviewed by two nurses, a community nurse and a care coordinator. The database also highlights and warns these nurses of any abnormal value received and allows early intervention when warranted.

But the data capture of Dr. Cooks' patients and the successes we have had are but one block of the community structure. We need to develop others. This ecosystem of care needs further alignment and expansion. Who are the people in your neighborhood community of care? For children at risk for diabetes, obesity and asthma it requires partnering with the local school system to identify these children and their parents and offer the same care and compliance support that is offered to adults. Second, the role of the rural hospital cannot be minimized. In the rural community the hospitals are often the largest employers and a central component of community survivability. Even the Joint Commission on Accreditation of Healthcare Organizations in its recent homeland security focused Healthcare at the Crossroad report acknowledges that in many

communities it's the hospitals that need to call a meeting to initiate all hazards preparation. But, life state management is often an asymbiotic relationship with hospitals that are, after all in the sickness business. Nevertheless there is a clear and compelling role for the reinvention of hospitals in the rural communities to join forces in being a key component in longitudinal management of chronic patients. I would be remiss if I did not mention the role of the payers in this community of care. Health care financing is broken as is witnessed by the unprecedented rise in our medical inflation rate. It is the rural communities, often made up of small employers, or self-employed individuals, who are the least able to withstand the 15% annual rate increases. Logic should dictate that new CMS demonstration projects that tie payment to risk based population management may bear fruit in aligning our community of care's incentives to achieve cost effective, quality of life improving health outcomes. These demonstration models should be watched and copied by state Medicaid programs and afforded by CMS to the rural communities for participation.

Rural Physicians and Telemedicine

I have left the physicians in the rural community to last in my comments because if anything they are clearly the most important part of the equation and deserve a deeper examination. The community of care only works if a well qualified, caring physician encourages patients to participate. But for the physician in a rural setting, survivability is more complex than just caring. The urban physician, particularly if practicing in a large group practice, enjoys the benefits of taking less call, earning more money, staying connected to their peers. For the rural patient to survive, for the rural hospital to survive, and for the rural community to survive, the rural physician must survive. What is needed is an opportunity to place rural physicians on a practice plane with their urban peers. High-speed connectivity to the best of breed support programs to promote practice efficiencies is required. A brief sampling of value driven practice enhancements includes: desk top rather than hospital site; web based video conferencing for education; and peer-to-peer conferencing. This would reduce rural provider isolation but in a means and manner convenient to the provider. An electronic medical record including links to the community of care record that will enable the physician not only to manage his or her practice but to use the community of care record as a link to the totality of the patients' health and activities. For example, one noted challenge to the rural physician is in the area of cancelled or missed appointments. Patients in rural communities often face transportation barriers or uncertain schedules. The community of care link would keep a record of scheduled appointments and allow the community nurse to remind the patient of their appointment with the physician. Medication management is another challenge. Whether it is multiple prescriptions from rural and urban providers, or simply patients who forget to take their medicine, a medication management tool embodied in the community of care record is a requirement. In addition a robust information environment becomes a ubiquitous tool for connecting traditional specialty referral patterns from both within and without the rural community. One common complaint of rural physicians is that a patient referred to an urban specialist can either become a lost patient, or worse, a patient who returns to a rural physician for follow up care without the rural physician knowing what has been recommended. Finally a robust suite of services provides

sufficient aggregated data upon which to draw lessons learned about best practices, cost effective outcomes, and life state success stories that should resonate with the payers.

The rural health community ecosystem is dependent upon each part playing a role if the system as a whole is to survive. High tech and high touch must integrate in a means and manner that produces demonstrable improved outcomes. If survivability is the question, then connectivity is the answer.

Thank you for allowing me to share these observations with you.